Office Memorandum • UNITED STATES GOVERNMENT

TO : The Files

DATE: 19 July 1956

FROM : [redacted] STAT

SUBJECT: SARAH Beacon Search Equipment Failure

1. The subject matter contained in this report concerns the operational failure of the airborne subminiature SARAH Search Equipment during recent field tests at the Marine Air Station, Quantico, Virginia.

2. During installation, the personnel concerned inadvertently applied power to the subminiature receiver/transmitter power supply through incorrect taps on the power unit input receptacle. It is possible the high voltage developed by the power unit was sufficient to damage the output tube (V305) in the time base circuit by developing a screen to cathode short. In any case, a faulty tube existed in the time base circuit which effectively grounded the + 150 volts supply from the power unit. The input power was then correctly applied to the power unit through the selection of the proper taps. The shorted time base tube was not replaced and the high current (350 ma approximate) drawn from the time base screen and plate voltage supply section of the power unit was sufficient to open the plate resistors in the rectifier section, and the power unit was so disabled. When the personnel installing the SARAH Search Equipment received a duplicate power unit, the same malfunction occurred because the receiver/transmitter unit had not yet been repaired. A duplicate receiver/transmitter unit was then substituted for the damaged unit. The duplicate unit could not function since now the two power units were disabled. Since all of these malfunctions occurred in the time base circuit or in the rectifier section of the power unit supplying voltages to the time base, a lack of vertical trace presented itself on the cathode ray tube.

3. The foregoing description of the SARAH Search Equipment operation is believed to be the primary reason for the temporary discontinuance of the field tests.

4. There are three input terminals on the inverter and the reason for this number is not known since a circuit diagram of the unit is not available. However, since the plus 24 volts DC output is grounded to the FRAME, it is evident that this condition is not compatible with normal aircraft 24 volt DC supplies where the minus 24 volts DC side is grounded to the aircraft through the bus bars. Operation of the inverter in this condition requires

that the inverter and all SARAH Equipment be physically separated from aircraft metal. This assumption would explain why all the 24 V DC circuit breakers in the aircraft opened during one flight test.

5. On 11 July 1956, the subminiature SARAH Search Equipment consisting of two complete receiver/transmitter and power units were picked up by the R&D Laboratory for repair.

6. One complete unit has been repaired. ✓

7. The repair of the second unit is contingent upon receipt of required tube replacements now ordered through Mr. W. Hart.

8. This report brings up to date, as of 18 July 1956, the participation of the R&D Laboratory in this portion of the SARAH Search field test activity.

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